

**PROJECT MANUAL, INCLUDING SPECIFICATIONS  
FOR**

***CAINS POND RESTORATION***

SEABROOK, NH

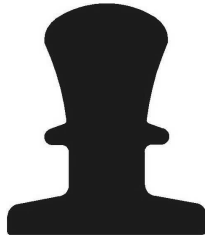
**October 9, 2009**

**OWNER:**



**SEABROOK CONSERVATION COMMISSION**

**ENGINEER:**



**WATERFRONT ENGINEERS LLC  
3 LINDA LANE  
STRATHAM, NH 03885**

**CAINS POND RESTORATION  
PROJECT MANUAL &  
TECHNICAL SPECIFICATIONS**

**PROJECT MANUAL**

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# **CAINS POND RESTORATION**

## **PROJECT MANUAL & TECHNICAL SPECIFICATIONS**

### **PROJECT MANUAL**

#### **INVITATION FOR PROPOSAL**

The Seabrook Conservation Commission invites interested contractors to submit proposals for *Cains Pond Restoration- Phase 1*, in complete conformance with the attached "Scope of Work". All prices submitted shall be lump sum and no additional compensation will be made by the Seabrook Conservation Commission unless approved by written change order signed by the Seabrook Conservation Commission. All work shall conform to the attached specifications.

The Seabrook Conservation Commission reserves the right to reject any and all proposals not conforming to the specifications or deemed not to be in the best interest of the Town. Proposals will be evaluated by the Seabrook Conservation Commission. The quality and service, availability and the contractor's experience in working with the Town, particularly if the combined crew option is selected, will be considered for the final selection. Site access is across private property and contractor care and protection of the private property is critical.

The successful contractor must submit a performance bond for the full value of the work contracted, proof of liability and worker's compensation insurance within five (5) days of the "Notice of Selection" as the acceptable contractor.

Proposals will be sealed and clearly marked, ***Cains Pond Restoration – Phase 1*** and shall be submitted not later than 2:00p.m., October 20, 2008 to the Seabrook Conservation Commission, Seabrook Town Office, 99 Lafayette Road, Seabrook, New Hampshire.

This project is funded in part by a grant from the NH Department of Environmental Services with funding from the US EPA Section 319 of the Clean Water Act. Performance and Payment Bonds are required.

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#### **PREBID SITE VISIT**

A mandatory prebid meeting and site visit will be held on October 15 at 2:00 pm at Cains Pond, Lakeshore Drive.

The purpose of this visit is to allow interested bidders entrance to project site to investigate all existing conditions.

### **PROJECT CONTACTS**

OWNER/  
OWNERS

REPRESENTATIVE:

Seabrook Conservation Commission  
Town of Seabrook  
PO Box 456  
Seabrook, NH 03874

ENGINEER:

Waterfront Engineers LLC  
Mr. Duncan Mellor, PE  
3 Linda Lane  
Stratham, New Hampshire 03885  
603-772-3706  
[dmellor@waterfrontengineers.com](mailto:dmellor@waterfrontengineers.com)

SURVEYOR:

Millennium Engineering, Inc.  
Mr. Henry Boyd  
PO box 475  
13 Hampton Rd.  
Exeter, NH 03833  
603-778-0528  
[hboyd@mei.com](mailto:hboyd@mei.com)

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**SCOPE OF WORK**

The successful contractor shall provide all labor, materials and equipment to provide *Cains Pond Restoration – Phase 1* in accordance with the contract documents and bid options selected. If the bid option for the Town DPW to provide the excavator and operator is selected, the contractor must work in a harmonious nature with the Seabrook Department of Public Works, during work hours suitable to the Public Works Department. In this option the defined work tasks to be performed by the contractor shall be bid lump sum, but since the Town will be performing the excavation, the hauling away of excess soil and the importing of the specified excavation backfill only, will be on a unit price per cubic yard, paid based on the volumes actually hauled and used.

The contractor shall be responsible for all work specified in the contract documents, including removal of existing vegetation, excavation and installation of stormwater treatment manholes, piping, incidental work and restoration of the work areas disturbed by this work. All work to be in complete accordance with sound construction practice in conformance with the attached contract documents.

The NHDES Wetlands permit has been issued. The Contractor must read and sign a copy of the permit before mobilizing to the site.

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**SPECIFICATIONS**

**DIVISION I: GENERAL REQUIREMENTS**

- 1.1 The following are minimum requirements (as specified in the contract documents):
- a. Access area stabilization and erosion controls.
  - b. Removal of existing vegetation roots, stumps, excavation and installation of stormwater treatment manholes, piping, incidental work and restoration of the work areas disturbed by this work.
  - c. Restore project site; including incidental work, repair/replacement of disturbed areas, signs, posts, etc. and repair of damage.
  - d. Mobilization/demobilization as required.
  - e. Construction and erosion control measures.
  - f. Compliance with all permit conditions.
- 1.2 Definitions.
- 1.2.1 "Addenda" means written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the Contract Documents, drawings and specifications. by additions, deletions, clarifications or conditions. Such written or graphic instruments will be issued no less than five days before the bid opening.
- 1.2.2 "Bid" means the offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the work to be performed.
- 1.2.3 "Bidder" means any person, firm or corporation submitting a bid for the work.
- 1.2.4 "Bonds" means bid, performance, and payment bonds and other instruments of security, furnished by the Contractor and its surety in accordance with the Contract Documents.
- 1.2.5 "Change order" means a written order to the Contractor authorizing an addition, deletion or revision in the work within the general scope of the

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Contract Documents, or authorizing an adjustment in the Contract Price or Contract Time.

1.2.6 "Contract Documents" means the Contract, including any advertisement for bids, information for bidders, bids, bid bonds, Agreements, performance bonds, notices of award, notices to proceed, change orders, plans, specifications and addenda.

1.2.7 "Contract Price" means the total monies payable to the Contractor under the terms and conditions of the Contract Documents.

1.2.8 "Contract Time" means the number of calendar days stated in the Contract Documents for the completion of the Work.

1.2.9 "Contractor" means the person, firm or corporation with whom the Owner has executed the Agreement.

1.2.10 "Drawings" mean the part of the Contract Documents which show the characteristics and scope of the work to be performed and which have been prepared or approved by the Engineer.

1.2.11 "Engineer" means the person, firm or corporation named as such in the contract documents.

1.2.12 "Field order" means a written order effecting a change in the work not relating to an adjustment in the contract price or an extension of the contract time and issued by the Engineer to the Contractor during construction.

1.2.13 "Owner" means the Seabrook Conservation Commission.

1.2.14 "Plans" means the contract drawings or exact reproductions thereof which show the scope, character, dimensions and details of the work and which have been prepared or approved by the Engineer.

1.2.15 "Project" means the undertaking to be performed as provided in the Contract Documents.

1.2.16 "Remove" in reference to structures means demolition/excavation of an item or structure and the legal disposal of that item off site.

1.2.17 "Special conditions" means revisions or additions to these general conditions or specifications applicable to an individual project.

1.2.18 "Specifications" means a section of the contract documents

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consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

1.2.19 "Subcontractor" means an individual, firm or corporation having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the work at the site.

1.2.20 "Substantial Completion" means that date as certified by the Engineer when the construction of the Project or a specified part thereof is sufficiently completed, in accordance with the Contract Documents, so that the Project or specific part can be utilized for the purposes for which it is intended.

1.2.21 "Supplementary General Conditions" means additions or modifications to these general conditions supplying detailed information required for the project documents.

1.2.22 "Supplier" means any person or organization who supplies materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the site.

1.2.23 "Work" means all labor necessary to produce the construction required by the contract documents, and all materials and equipment incorporated or to be incorporated in the project.

**1.3 Materials, Service, facilities and workmanship shall be furnished as follows:**

1.3.1 Except as otherwise specifically stated in the contract documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every nature, and all other Service and facilities of every nature whatsoever necessary to execute, complete, and deliver the work within the specified time.

1.3.2 Unless otherwise specifically provided for in the specifications, all workmanship, equipment, materials and articles incorporated in the work shall be new and the best grade of the respective kinds for the purpose.

1.3.4 Materials which are specified by reference to the number or symbol of a specific standard, such as an ASTM standard, a specification or other similar standard, shall comply with requirements in the latest revision thereof and any amendment or supplement thereto in effect on the date of the advertisement for bids, except as limited to type, class or grade, or modified in such reference. The standards referred to shall have full force



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and effect as though printed therein.

1.3.5 For equipment or for materials, when requested by the Engineer, the Contractor shall submit certificates of compliance from the manufacturer, certifying that the equipment or the materials comply with the requirements of the specifications or the standards.

- 1.4 No material, supplies, or equipment to be installed or furnished under this contract shall be purchased subject to any chattel mortgage or under a conditional sale, lease purchase or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. The Contractor shall warrant good title to all materials, supplies, and equipment installed or incorporated in the work and upon completion of all work, shall deliver the same together with all improvements and appurtenances constructed or placed thereon by him to the Owner free from any claims, liens, or charges. Neither the Contractor nor any person, firm or corporation furnishing any material or labor for any work covered by this contract shall have any right to a lien upon any improvement or appurtenance thereon. Nothing contained in this paragraph, however, shall defeat or impair the right of persons furnishing materials or labor to recover under any bond given by the Contractor for their protection or any rights under a law permitting such persons to look to funds due the Contractor in the hands of the Owner. The provisions of this paragraph shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing materials for the work when formal contract is entered into for such materials. The Contractor shall provide all material testing.

- 1.5 "Or equal" clause, substitutions, and Contractor's options.

1.5.1 Whenever a material, article, or piece of equipment is identified on the plans or in the specifications by reference to manufacturers or vendor's names, trade names, catalogue numbers, etc., it is intended merely to establish a standard of quality and performance. Any material, article, or equipment of other manufacturers and vendors, which will perform satisfactorily the duties imposed by the general design, shall be considered equally acceptable provided the material, article, or equipment so proposed is, in the opinion of the Engineer, of equal quality and function. The Engineer shall determine equality based on such information, tests, or other supporting data that may be required of the Contractor.

- 1.5.2 Upon acceptance and approval by the Engineer of an equal product, it shall remain the responsibility of the Contractor to coordinate installation of the item with all other items to be furnished to assure proper fitting

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together of all items. Similar responsibility applies to items which are left to the Contractor's option. Any additional cost of equal items and any additional cost incidental] to the coordination and/or fitting together of such items shall be borne by the Contractor at no extra cost to the Owner.

1.5.3 If a specified or equal item is not available to meet the construction schedule, the Contractor may propose a substitute item of less than equal performance and quality. If this substitute is acceptable to the Engineer, any difference in purchase cost or costs incidental to the installation of such item will be negotiated between the parties to the contract.

1.5.4 Neither equal nor substitute items shall be installed without written approval of the Engineer.

### **1.6 Control**

1.6.1 For structures and removals, the Engineer may specify a temporary bench mark in and around the project site for the use of the Contractor and for the Engineer's own reference in checking the work in progress. The Contractor shall set up whatever specific detail controls he may need for establishing location, elevation lines and grades of all structures. The Contractor shall provide a New Hampshire licensed land surveyor to field locate property lines and is responsible for locating limits of work.

1.6.2 The Contractor shall be responsible for the location and setting lines and grades.

1.6.3 Protection of stakes. The Contractor shall protect and preserve all of the established baseline stakes, bench marks, or other controls. Any of these items destroyed or lost through fault of the Contractor will be replaced to the satisfaction of the Engineer and at the Contractor's expense.

1.7 Contractors obligation is as follows: The Contractor shall and in good workmanlike manner, do and perform all work and furnish and pay for all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary or proper to perform and complete all the work required by this contract, within the time stated in the proposal in accordance with the plans and drawings covered by this contract, and any and all supplemental plans and drawings, in accordance with the directions of the Engineer as given from time to time during the progress of the work, whether or not he considers the direction in accordance with the terms of the contract. He shall furnish, erect, maintain and remove such construction plant and such temporary works as may be required. The Contractor shall observe, comply with, and be

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subject to all terms, conditions, requirements, and limitations of the contract documents, and shall do, carry on and complete the entire work to the satisfaction of the Engineer and Owner. Contractor shall carry on the work and adhere to the progress schedule during all disputes, disagreements or unresolved claims with the Owner. No work shall be delayed or postponed pending the resolution of any disputes, disagreements, or claims except as the Owner and Contractor may otherwise agree in writing.

- 1.8 In the event of temporary suspension of work, or during inclement weather, or whenever the Engineer shall direct, the Contractor and its Subcontractors shall protect their work and materials against damage or injury- from the weather. If, in the opinion of the Engineer, any work or material shall have been damaged or injured by reason of failure on the part of the Contractor or any of its Subcontractors to so protect its work, such materials shall be removed and replaced at the expense of the Contractor.
- 1.9 Protection of work and property shall be provided as follows:
  - 1.9.1 The Contractor shall at all times safely guard the Owners and adjacent properties from injury or loss in connection with this contract. He shall at all times safely guard and protect its own work, and that of adjacent property, from damage. The Contractor shall replace or make good any such damage, loss or injury unless caused directly by errors contained in the contract, or by the Owner, or its authorized representatives.
  - 1.9.2 The Contractor shall take all necessary precautions for the safety of employees on the work site, and shall comply with all applicable provisions of federal, state and municipal safety laws and building codes to prevent accidents or injury to persons on, about or adjacent to the premises where the work is being performed. He shall erect and properly maintain at all times, as required by the conditions and progress of the work, all necessary safeguards for the protection of the workmen and the public and shall post danger signs warning against the hazards created by such features of construction as protruding nails, hoists, well holes, stairways, trenches and other excavations, and falling materials, and he shall designate a responsible member of its organization on the work, whose duty shall be the prevention of accidents. The name and position of any person so designated shall be reported to the Engineer by the Contractor, The person so designated shall be available by phone during nonworking hours.
  - 1.9.3 In case of emergency which threatens loss or injury of property,

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and/or safety of life, the Contractor is allowed to act, without previous instructions from the Engineer. He shall notify the Engineer immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted in writing to the Engineer for approval.

1.9.4 When the Contractor has not taken action but has notified the Engineer of an emergency threatening injury to persons or damage to the work or any adjoining property, he shall act as instructed or authorized.

1.9.5 The intention is not to relieve the Contractor from acting, but to provide for consultations between Engineer and Contractor in an emergency which permits time for such consultations.

1.9.6 The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided in Article 1.13 (extra work and change orders) of the general conditions.

1.10 Inspection of work for conformance with plans and specifications.

1.10.1 For purposes of inspection and for any other purpose, the Owner and the Engineer may enter upon the work and the premises used by the Contractor, and the Contractor shall provide safe and proper facilities therefore. The Engineer shall be furnished with every facility for ascertaining that the work is in accordance with the requirements and intention of this contract, even to the extent of uncovering or taking down portions of finished work.

1.10.2 During construction and on its completion, all work shall conform to the location, lines, levels and grades indicated on the drawings and shall be built in a workmanlike manner, in accordance with the drawings and specifications and the supplementary directions given from time to time by the Engineer. In no case shall any work which exceeds the requirements of the drawings and specifications be paid for as extra work unless ordered in writing by the Engineer.

1.10.3 Unauthorized work and work not conforming to plans and specifications shall be handled as follows:

- a. Work considered by the Engineer to be outside of or different from the plans and specifications and done without instruction by the Engineer, or in wrong location, or done without proper lines or levels, may be ordered by the Engineer to be uncovered or dismantled.
- b. Work done in the absence of the Engineer or its agent may be ordered by the Engineer to be uncovered or dismantled.

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c. Should the work thus exposed or examined prove satisfactory, the uncovering or dismantling and the replacement of material and rebuilding of the work shall be considered as 'Extra Work" to be processed in accordance with Article 1.13.

d. Should the work thus exposed or examined prove to be unsatisfactory the uncovering or dismantling and the replacement of material and rebuilding of the work shall be at the expense of the Contractor.

1.11 Reports, records and data shall be furnished as follows: The Contractor shall submit to the Owner such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this contract.

1.12 Superintendence by Contractor shall be furnished as follows: At the site of the work, the Contractor shall employ a competent construction superintendent or foreman who shall have full authority to act for the Contractor. It is understood that such representative shall be acceptable to the Engineer and shall be the one who can be continued in that capacity for the particular job involved unless he ceases to be on the Contractor's payroll.

1.13 Extra work and change-orders shall be processed as follows:

1.13.1 The Engineer may at any time by Written order and without notice to the sureties require the performance of such extra work or changes in the work as may be found necessary. The amount of compensation to be paid to the Contractor for extra work so ordered shall be made in accordance with whichever of the following plans the Engineer elects:

a. A price agreed upon between the parties and stipulated in the order for the extra work.

b. A price determined by adding 15 percent to the "reasonable cost" of the extra work performed, such "reasonable" cost to be determined by the Engineer in accordance with the following paragraph.

1.13.2 The Engineer shall include the reasonable cost to the Contractor of all materials used, of all labor, both common and skilled, of foreman, trucks, and the fair market rental rate for all machinery and equipment for the period employed directly on the work. The reasonable cost for extra work shall include the cost to the Contractor of any additional insurance that maybe required covering public liability for injury to persons and

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property, the cost of workmen's compensation insurance, federal social security, and any other costs based on payrolls, and required by law. The cost of extra work shall not include any cost or rental of small tools, buildings, or any portion of the time of the Contractor, its project supervisor or its superintendent, as assessed upon the amount of extra work, these items being considered covered by the 15 percent added to the reasonable cost. The reasonable cost for extra work shall also include the premium cost, if any, for additional bonds and insurance required because of the changes in the work.

1.13.3 In the case of extra work which is done by Subcontractors under the specific contract, or otherwise if so approved by the Engineer, the 15 percent added to the reasonable cost of the work will be allowed only to the Subcontractors. On such work an additional percentage of the reasonable cost (before addition of the 15 percent) will be paid to the Contractor for its work in directing the operations of the Subcontractor, for administrative supervision, and for any overhead costs. Such percentage shall be in accordance with the following schedule: reasonable cost up to and including \$50,000, 10 percent; next \$50,000 to and including \$100,000, 7-1/2 percent; greater than \$100,000, 5 percent.

1.14 Defective work shall be processed as follows:

1.14.1 The Contractor shall promptly remove from the premises all materials and work condemned by the Engineer as failing to meet contract requirements, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute its own work in accordance with the contract and without expense to the Owner and shall bear the expense of making good all work of other Contractors which was destroyed or damaged by such removal or replacement.

1.14.2 All removal and replacement work shall be done at the Contractor's expense. If the Contractor does not take action to remove such condemned work and materials within 30 days after receipt of written notice, the Owner may remove them and store the material at the expense of the Contractor. If the Contractor does not pay the expense of such removal and storage within 10 days time thereafter, the Owner may, upon 10 days written notice, sell such materials at auction or at private sale and shall pay to the Contractor any net proceeds thereof, after deducting all the costs and expenses that should have been borne by the Contractor.

1.15 Claims for Differing Site Conditions shall be processed as follows:

1.15.1 The Contractor shall promptly and before such conditions are disturbed, notify the Engineer in Writing of:

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- a. Subsurface or latent physical conditions at the site differing materially from those indicated in this contract: or.
- b. Unknown physical conditions at the site, differing materially from those ordinarily encountered and generally recognized as inherent in the type of work provided for in this contract.

1.15.2 The Engineer shall promptly investigate the conditions. If he finds that conditions differ materially and will cause an increase or decrease in the Contractors cost or the time required to perform any part of the work under this contract whether or not changed as a result of such conditions, the Engineer may make an equitable adjustment and modify the contract in writing. For dredging work, if the Contractor encounters hard material differing from the expected conditions, the hard material shall be left in place at no added cost and the Contractor shall notify the Engineer and continue to remove the surrounding material consistent with the expected conditions within the work areas.

1.15.3 No claim of the Contractor under this clause shall be allowed unless the Contractor has given proper notice as required in paragraph 1.15.1 of this clause.

1.15.4 No claim by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

1.16 Claims for extra cost shall be processed as follows:

1.16.1 No claim for extra work or cost shall be allowed unless the same was done pursuant to a written order by the Engineer, approved by the Owner and the claim presented for payment with the first estimate after the changed or extra work is done. When work is performed under the terms of Article 1.13, the Contractor shall furnish satisfactory bills, payrolls and vouchers covering all items of cost when requested by the Owner and shall allow the Owner access to accounts relating thereto.

1.16.2 If the Contractor claims that any instructions by drawings or similar documents issued after the date of the contract involve extra cost under the contract, he shall give the Engineer written notice after the receipt of such instruction and before proceeding to execute the work, except in an emergency which threatens life or property, then the procedure shall be as provided for under Article 1.13 "Extra Work & Change Orders." No claim shall be valid unless so made.

1.17 Right of the Owner to terminate contract:

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1.17.1 In the event that any of the provisions of this contract are violated by the Contractor, or by any of its Subcontractors, the Owner may serve written notice upon the Contractor and the surety of its intention to terminate the contract, and unless within 10 days after the serving of such notice upon the Contractor, such violation or delay shall cease and satisfactory arrangement for correction be made, the contract shall, upon the expiration of said 10 days cease and terminate. In the event of any such termination, the Owner shall immediately serve notice thereof upon the surety and the Contractor and the surety shall have the right to take over and perform the contract: provided, however, that if the surety does not commence performance thereof within 10 days from the date of the mailing to such surety of notice of termination, the Owner may take over the work and prosecute the same to completion by contract or by force account for the account and at the expense of the Contractor and the Contractor and its surety shall be liable to the Owner for any excess cost occasioned the Owner thereby, and in such event the Owner may take possession of and utilize in completing the work, such materials, appliances, and plant as may be on the site of the work and necessary therefore.

1.17.2 If the Contractor should be adjudged bankrupt, or if he should make a general assignment for the benefit of its creditors, or if a receiver should be appointed on account of its insolvency, or if he should refuse or should fail, except in cases for which extensions of time are provided, to supply enough skilled workmen or materials, or if he should fail to make payments to Subcontractors or for material or labor, so as to affect the progress of the work, or be guilty of a violation of the contract, then the Owner, upon the written notice of the Engineer that sufficient cause exists to justify such action may, without prejudice to any other right or remedy and after giving the Contractor and its surety 7 days' written notice, terminate the employment of the Contractor and take possession of the premises and of all materials, tools, equipment and other facilities installed on the work and paid for by the Owner, and finish the work by whatever method he may deem expedient. In the case of termination of this contract before completion from any cause whatever, the Contractor, if notified to do so by the Owner, shall promptly remove any part or all of its equipment and supplies at the expense of the Contractor. If such expense exceeds such unpaid balance, the Contractor shall pay the difference to the Owner. The expense incurred by the Owner as herein provided, and the damage incurred through the Contractor's default, shall be approved by the Engineer.

1.17.3 Where the contract has been terminated by the Owner, said termination shall not affect or terminate any of the rights of the Owner as



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against the Contractor or its surety then existing or which may thereafter accrue because of such default. Any retention or payment of monies by the Owner due the Contractor under the terms of the contract, shall not release the Contractor or its surety from liability for its default.

1.18 Construction schedule and periodic estimates shall provide for the following:

1.18.1 Before starting the work or upon request by the Engineer during its progress, the Contractor shall submit to the Engineer a work plan including a schedule of values showing construction methods and the various steps he intends to take in completing the work.

1.18.2 Before the first partial payment is made, the Contractor shall prepare and submit to the Engineer:

- a. A written schedule fixing the dates for submittals; and
- b. A written schedule fixing the respective dates for the start and completion of segments of the work. Each such schedule shall be subject to review and change during the progress of the work, with the approval of the Owner.

1.19 Payments to the Contractor shall be made as follows:

1.19.1 Progress payments. The Owner will once each month make a progress payment to the Contractor on the basis of an estimate of the total amount of work done to the time of the estimate and its value as prepared by the Contractor and approved by the Engineer.

1.20 In the use of premises or removal of debris, the Contractor expressly undertakes at its own expense: to take every precaution against injuries to persons or damage to property; to maintain sanitary conditions; to store its apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not interfere with the progress of its work or the work of any other Contractors; to place upon the work or any part thereof only such loads as are consistent with the safety of that portion of the work; to clean up frequently all refuse, rubbish, scrap materials and debris caused by its operations, to the end that at all times the site of the work shall present an orderly and workmanlike appearance; before final payment to remove all surplus material, false work, temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from its operations, and to put the site in an orderly condition; to effect all cutting, fitting or patching of its work required to make the same conform to the plans and specifications and, except with

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the consent of the Engineer, not to cut or otherwise alter the work of any other Contractor; to provide and maintain in a sanitary condition such toilet accommodations for the use of its employees as may be necessary to comply with the requirements of the state and local boards of health, or of other bodies or authorities having jurisdiction.

- 1.21 With reference to errors and inconsistency in contract documents, any provisions in any of the contract documents which may be in conflict with the paragraphs in these general conditions shall be subject to the following order of precedence for interpretation:

1.21.1 Supplementary general conditions will govern general conditions.

1.21.2 Technical specifications will govern supplementary conditions and general conditions.

1.21.3 Technical specifications will govern plans, supplementary conditions and general conditions.

1.21.4 Special conditions will govern plans, technical specifications, supplementary conditions and general conditions.

1.21.5 The Contractor shall take no advantage of any apparent error or omission in the plans or specifications. In the event the Contractor discovers such an error or omission, he shall notify the Engineer. The Engineer will then make such corrections and interpretations as may be deemed necessary for fulfilling the intent of the plans and specifications.

- 1.22 The Contractor shall post project permits on site and maintain posted permits for the duration of the project.

- 1.23 Public convenience and traffic control requirements:

1.23.1 The Contractor shall at all times so conduct its work as to assure minimal obstruction to traffic. The safety and convenience of the general public along the work site route and the protection of property shall be provided for by the Contractor. Public roads shall not be made dirty by the Contractor and satisfactory truck cleaning prior to entering the roads is required. If public roads are made dirty by the Contractor, the Contractor is required to clean the affected areas the same day at its cost, in accordance with local, state and federal rules and laws, including obtaining any necessary permits.

1.23.2 Fire hydrants and water for fire protection on or adjacent to the work site shall be kept accessible to fire apparatus at all times.

# **CAINS POND RESTORATION**

## **PROJECT MANUAL & TECHNICAL SPECIFICATIONS**

### **1.24 Indemnification**

The Contractor will indemnify and hold harmless the Owner and the Engineer and their agents and employees from and against all claims, damages, losses, and expenses including attorney's fees arising out of or resulting from the performance of the Work, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting there from; and is caused in whole or in part by any negligent or willful act or omission of the Contractor, and Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable. In any and all claims against the Owner or the Engineer, or any of their agents or employees, by any employees of the Contractor, and Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them maybe liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by disability benefit or other employee benefit acts. The obligation of the Contractor under this paragraph shall not extend to the liability of the Engineer, arising out of the preparation of Drawings, designs or Specifications.

- 1.25 During construction, the Contractor shall take precautions sufficient to avoid the leaching or runoff of polluting substances such as mud, silt, clay, fuels, oils. Bitumens, calcium chloride and any other polluting materials which are unsightly or which may be harmful to humans, fish, or other life, into groundwaters and surface waters.

## **DIVISION II: PAYMENT**

- 2.1 Contractor may request progress payments monthly or after completion of the major tasks in the project, subject to the Owners review, verification and value assessment. Final payment shall not be made prior to the Owners acceptance.

## **DIVISION III: PROCEDURES, METHODS AND MATERIALS**

- 3.1 The Contractor shall be responsible for completing all required work specified in the contract documents.
- 3.2 The Contractor shall be responsible for determining means and methods

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for completing the work as specified in the contract documents. The Contractor shall comply with all conditions in the permits for this project.

**DIVISION IV: WARRANTIES & BONDS**

- 4.1 All components, materials and workmanship shall be warranted for a one-year period from date of final acceptance.
- 4.2 A performance bond and payment bond for an amount equal to the contract amount shall be provided for 1 year beyond final acceptance. A bid surety in the form of a check made out to the Seabrook Conservation Commission for \$200 shall be provided and it shall be returned to the bidders following successful signing of a contract with the selected bidder.
- 4.3 Written warranties, Affidavit of Payment and subcontractor/ material suppliers waivers of liens will be submitted with final payment request. Upon the Contractor being paid in full by the Owner, the Contractor agrees that it will thereafter indemnify and save the Owner harmless from laborers', material, mechanics, or any other liens or claims upon the premises, arising out of the labor and materials furnished by or in any other way chargeable to the Contractor or by any subcontractor or supplier.
- 4.4 Payments withheld:  
Payments otherwise due the Contractor may be withheld by the Owner on account of:
  - a) Unsatisfactory progress of the work or defective materials or workmanship which in the judgment of the Engineer is sufficiently serious to justify such withholding.
  - b) Claims filed or evidence which in the Engineer's opinion indicates probable filing of claims.
  - c) Failure of the Contractor to make payments promptly to Subcontractor or to make payments for labor or such materials as are purchased by the Contractor.
  - d) When the Engineer is of the opinion that the percentage of payment requested exceeds the percentage of completion.

In the event any payments otherwise due are withheld as a result of any of the

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foregoing, the Engineer will notify the Contractor of the cause or causes for withholding same. If said cause or causes are removed by the Contractor within seven days after receipt of such notice, the Owner will promptly pay the Contractor the amount so withheld. If said cause or causes are not removed by the Contractor within seven days after receipt of such notice, the Owner may take whatever action he may deem necessary to remove said cause or causes and charge the cost thereof against any unpaid balance due the Contractor, and in the event the cost thereof exceeds such balance, the Contractor and its sureties shall be liable for such excess.

The Engineer shall have the right to withhold from certification any item or portion of Contractor's request for payment which he deems unjustified or excessive and certify the remainder for payment.

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**AFFIDAVIT OF PAYMENT OF CLAIMS  
AND  
CERTIFICATION OF MATERIALS**

By: \_\_\_\_\_ Contract No. \_\_\_\_\_  
Contractor

Address: \_\_\_\_\_  
\_\_\_\_\_

This day \_\_\_\_\_ personally  
appeared before me, \_\_\_\_\_, a Notary Public in  
and for the City (County) of \_\_\_\_\_,  
\_\_\_\_\_ and, being by me first duly sworn/affirmed, states that all  
materials meet or exceed the specifications of the Contract and that all work to be  
performed under the contract has been fully completed, all subcontractors and  
suppliers of labor and materials, and all lienors under the contract have been paid in  
full have been paid all sums due them for work performed or materials furnished in the  
performance of the Contract between Seabrook Conservation Commission  
Association, Owner, and \_\_\_\_\_, Contractor,  
dated \_\_\_\_\_, 20\_\_, for the construction of *Cains Pond Restoration*  
project or arrangements have been made by the Contractor satisfactory to such  
subcontractors and suppliers with respect of payment of such sums as may be due  
them by the Contractor.

By: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Typed Name & Title of Person Signing

Subscribed and sworn/affirmed to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.  
My commission expires on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Notary Public (affix seal)

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**WAIVER OF LIEN FORM**

To: Seabrook Conservation Commission (Owner)

Whereas the undersigned has been engaged as a Subcontractor or as Material Supplier by \_\_\_\_\_ the General Contractor for the *Cains Pond Restoration – Phase 1*, to furnish work, labor or materials for said Project for Seabrook Conservation Commission, Owner.

Now, therefore the undersigned, upon receipt of the balance due us of  
\$ \_\_\_\_\_

waive and release any and all lien of claim of or right to lien under the Statutes of the State of New Hampshire, relating to mechanic's liens, with respect to and on said above described premises, and the improvements thereon, and on the material, fixtures, apparatus or machinery furnished and on the money funds, or other considerations due or to become due, the Subcontractor or Supplier from the General Contractor and/or the Owner of said premises, on account of labor, services, material, fixtures, or machinery heretofore furnished, or which may be furnished at any time hereafter by the undersigned, to or on account of the said General Contractor and/or said Owner for the above described premises.

Given under the hand and seal of the undersigned, this \_\_\_\_\_ day of \_\_\_\_\_, 2009

By: (subcontractor or material supplier)

**NOTARIZATION:**

Notary Public:

My Commission Expires:.

# **CAINS POND RESTORATION**

## **PROJECT MANUAL & TECHNICAL SPECIFICATIONS**

### **DIVISION V: ATTORNEY'S FEES AND COSTS**

The contractor agrees to indemnify Seabrook Conservation Commission, The Town of Seabrook and Waterfront Engineers LLC from any and all liability, loss or damage, including but not limited to, bodily injury, illness, death or property damage which the contractor becomes legally obligated to pay, including reasonable attorney's fees, investigative and discovery costs, or judgments against the Seabrook Conservation Commission or Waterfront Engineers LLC arising out of this agreement, caused by or arising out of, the negligence, fault, breach of warranty, product liability or strict liability is sole, joint, or several.

### **INSURANCE**

Successful contractor shall provide proof of insurance, as shown, before any work commences:

1. Liability coverage: General liability \$1,000,000 combined single limit, comprehensive form, broad form property damage; independent contractor's insurance; product completed/operator's insurance.
2. Vehicle Insurance: \$1,000,000 combined single limit, comprehensive form; hired/non-owned.
3. Worker's compensation: \$500,000; Statutory limits; Employer Liability.

These certificates shall list Seabrook Conservation Commission, The Town of Seabrook and Waterfront Engineers LLC as additionally named insured, include a waiver of subrogation and contain a provision that the insurance company will notify the certificate holder and Seabrook Conservation Commission by registered mail, at least fifteen (15) days in advance of any cancellation or material change.

### **FEDERAL GRANT REQUIREMENTS**

The contractor is considered a sub-grantee and the following federal CFR conditions apply.

*Drug-free Workplace.* 40 CFR 32.600 requires subawardees of section 319(h) grant funds to certify that they maintain a drug-free workplace. The Contractor by signing and submitting the agreement, certifies that it will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any grant-related activity.



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*Lobbying.* Federal restrictions regarding lobbying are provided in 40 CFR 34.100 and OMB Circulars A-87 and A-122. Federal grant funds may not be used to influence (or attempt to influence) a federal employee.

*"Buy American"* provision: In accordance with section 215 of the Clean Water Act (33 U.S.C. 1251 et seq.) and implementing EPA regulations, the contractor agrees that preference will be given to domestic construction materials by the contractor, subcontractors, materialmen and suppliers in the performance of this subagreement.

Contractors must use domestic construction materials in preference to nondomestic material if it is priced no more than 6 percent higher than the bid or offered price of the nondomestic material, including all costs of delivery to the construction site and any applicable duty, whether or not assessed. The grantee will normally base the computations on prices and costs in effect on the date of opening bids or proposals.

*Nondiscrimination.* 40 CFR 7.30 prohibits discrimination under any program or activity receiving EPA assistance on the basis of race, color, national origin, gender, handicap, or age. By signing the contractor agreement, the contractor certifies that it does not discriminate on the basis of race, color, national origin, gender, or handicap.

Contracting with small and minority firms, women's business enterprise and labor surplus area firms.

(1) The contractor will take all necessary affirmative steps to assure that minority firms, women's business enterprises, and labor surplus area firms are used when possible.

(2) Affirmative steps shall include:

(i) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;

(ii) Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources;

(iii) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority business, and women's business enterprises;

(iv) Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority business, and women's business enterprises;

(v) Using the services and assistance of the Small Business Administration, and the Minority Business Development Agency of the Department of Commerce; and

(vi) Requiring the prime contractor, if subcontracts are to be let, to take the affirmative steps listed in paragraphs (e)(2) (i) through (v) of this section.

Federal agencies are permitted to require changes, remedies, changed conditions, access and records retention, suspension of work, and other clauses approved by the Office of Federal Procurement Policy.

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Termination for cause and for convenience by the grantee or subgrantee including the manner by which it will be effected and the basis for settlement.

Compliance with Executive Order 11246 of September 24, 1965, entitled ``Equal Employment Opportunity," as amended by Executive Order 11375 of October 13, 1967, and as supplemented in Department of Labor regulations (41 CFR chapter 60).

Compliance with the Copeland ``Anti-Kickback" Act (18 U.S.C. 874) as supplemented in Department of Labor regulations (29 CFR part 3).

Compliance with Sections 103 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-330) as supplemented by Department of Labor regulations (29 CFR part 5).

Access by the grantee, the subgrantee, the Federal grantor agency, the Comptroller General of the United States, or any of their duly authorized representatives to any books, documents, papers, and records of the contractor which are directly pertinent to that specific contract for the purpose of making audit, examination, excerpts, and transcriptions.

Retention of all required records for three years after grantees or subgrantees make final payments and all other pending matters are closed.

Mandatory standards and policies relating to energy efficiency which are contained in the State energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. L. 94-163, 89 Stat. 871).

THE FOLLOWING FORMS MUST BE COMPLETED BY THE SELECTED CONTRACTOR AT THE TIME OF AWARD:

<http://www.epa.gov/ogd/AppKit/form/Certification.pdf>

<http://www.epa.gov/ogd/AppKit/form/Lobbying.pdf>

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**PROJECT MANUAL**

**PROPOSAL**

TO: Seabrook Conservation Commission

FOR: Furnishing all materials, labor and equipment to complete the attached Scope of Work, according to the Project Manual, including Contract Documents (incl. Drawings & Specifications) for *Cains Pond Restoration – Phase 1*. The work may include the Bid Option depending upon available budget and owner decisions, as described in the bid form.

The undersigned, as bidder, declares that the only person(s) or parties interested in this proposal as principals are those named herein; that this proposal is made without collusion with any other person, firm, or corporation; that s/he has carefully examined the work and the project's contract documents, attached hereto; and s/he proposes and agrees, if this proposal is accepted, that he will contract with the owner in the form of the contract attached, hereto; to provide all necessary tools, incidental materials, materials and methods to do all work and complete said work in the specified time prescribed; and that he will take payment for completed work, when approved by the Owner, for bid prices:

This agreement, made as of the \_\_\_\_\_ day of \_\_\_\_\_, 2009, between

**SEABROOK CONSERVATION COMMISSION**

(hereinafter called Owner)

&

\_\_\_\_\_  
(hereinafter called Contractor)

Project Name: **CAINS POND RESTORATION – PHASE 1**

Phone #: \_\_\_\_\_ e-mail: \_\_\_\_\_

Address: \_\_\_\_\_

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Witnessed that the Owner and Contractor, inconsideration of materials covenants hereinafter set forth, agree as follows:

**Article #1: Work**

The Contractor will provide all materials necessary and complete the work described in "Scope of Work" and completed in accordance with all "Specifications" contained in Project Manual for *Cains Pond Restoration – Phase 1*.

**Article #2: Contract Time**

The work shall be completed by November 15, 2009.

**Article #3: Contract Price**

The Owner shall pay the Contractor for the performance of work, and after completion of the project, for either Bid Option A or Bid Option B as follows:

BID ITEM # 1 BID OPTION A: All work complete, including mob/demob and access site restoration: Lump Sum \$ \_\_\_\_\_  
(figures)

BID ITEM #2 BID OPTION B: All work complete lump sum: but excluding excavation (excavator provided by Town). Surplus soil removal by unit price and providing crushed stone by unit price installed:  
Lump Sum \$ \_\_\_\_\_  
(figures)

Surplus Soil Removal	\$ _____	per cubic yard
	(figures)	
Crushed Stone	\$ _____	per cubic yard
	(figures)	
Structural Fill	\$ _____	per cubic yard
	(figures)	
Stone Riprap	\$ _____	per cubic yard
	(figures)	

In witness thereof, the parties, hereto, have executed this agreement the day and year first above written.

OWNER: **Seabrook Conservation Commission** CONTRACTOR: \_\_\_\_\_

BY: \_\_\_\_\_ BY: \_\_\_\_\_

ATTEST: \_\_\_\_\_ ATTEST: \_\_\_\_\_

DATE: \_\_\_\_\_ DATE: \_\_\_\_\_

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FULL NAME AND ADDRESS OF INDIVIDUAL, FIRM PARTNERSHIP OR CORPORATION  
SUBMITTING THIS BID:

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Telephone number: (\_\_\_\_) \_\_\_\_\_ Date: \_\_\_\_\_

Signed by: \_\_\_\_\_ Title: \_\_\_\_\_

Federal Identification or Social Security Number: \_\_\_\_\_

**NOTICE:** Bid shall be signed in black ink by person having proper legal authority.

**ACKNOWLEDGE ADDENDA HERE:**

ADDENDA:

No. _____	dated _____	2009
No. _____	dated _____	2009
No. _____	dated _____	2009
No. _____	dated _____	2009
No. _____	dated _____	2009

**REFERENCES:**

Please submit contact information or reference letters from 2 client references from work of similar nature, similar value, performed by the bidder.

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**INDEX FOR TECHNICAL SPECIFICATIONS**

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## **SECTION 02000**

### **SITEWORK**

#### **PART 1.0 - GENERAL**

##### **1.1 REFERENCE STANDARDS**

- A. Refer to other divisions of these specifications, other sections in this division, and drawings for related work, which may affect the work of this section.

The Contract Drawings indicate and show limits of construction for this project. These specifications specify material and work requirements for this project. Both are complementary to each other, and both shall be followed to properly complete the work.

All work included or ordered under this contract shall be done in conformity with these specifications, the applicable provisions of the State of NH Department of Transportation "Standard Specifications for Road and Bridge Construction", latest edition, hereinafter referred to as "Standard Specifications" or "NHDOT SSRBC", and the Seabrook Conservation Commission rules, and Town regulations, codes, ordinances.

- B. Definitions:

- 1) Definition: Whenever the word "Owner" is referred to in the Specifications, it shall mean SEABROOK CONSERVATION COMMISSION and it's authorized representatives.
- 2) Definition: Whenever the word "Owner Representative" is referred to in the Specifications, it shall mean the local SEABROOK CONSERVATION COMMISSION's authorized representative.
- 3) Definition: Whenever the word "Engineer" is referred to in the Specifications, it shall mean Waterfront Engineers LLC., and it's authorized representatives.

- C. Titles to divisions and paragraphs in these specifications and in the notes on the drawings are for convenience, and shall not be taken as an exact, correct or completed segregation of materials and labor.

- D. No responsibility is assumed by the Engineer or the Owner for omissions or duplications by the Contractor or its subcontractors due to real or alleged error in arrangement of matter in this specification or on the drawings.

- E. Latest revisions of federal, state and reference standards/specifications shall be used where only the specification number without date or revision number is given in specifications.
- F. Measurement and payment clauses listed in state and reference standards/specifications are not applicable.

## **1.2 SPECIFICATIONS**

If conflicts arise between any of the Specifications, the project manual specifications shall govern, unless otherwise directed by the Engineer.

## **1.3 GENERAL**

- A. Omissions from the plans and/or specifications of express reference to any labor or materials reasonably to be inferred there from and necessary for the proper execution of the work shall not relieve the Contractor or Subcontractor from furnishing them of a kind in keeping with the general character of the work.
- B. The Engineer shall decide all questions which may arise as to the quality, quantity, acceptability, fitness and rate of progress of the several kinds of work, and materials to be performed and furnished under the contract and shall decide all questions which may arise as to the fulfillment of the contract on the part of the Contractor. The Engineer's determination and decisions shall be final and conclusive.

## **1.4 PROJECT CONDITIONS**

- A. It was not possible for the Owner and/or Engineer to observe all existing conditions in the completion of these documents. Unforeseen conditions are expected to be discovered. The accuracy of the existing conditions data is not guaranteed to the Contractor. During the execution of the work, it shall be the Contractor's responsibility to discover, identify and observe existing conditions not anticipated by the Construction Documents and promptly notify the Engineer of such conditions in writing and proposed solutions at no additional cost. The Contractor's bid shall anticipate delays associated with conflicts with existing utilities.



## **1.5 ADDITIONAL REPSONSIBILITIES**

### **A. PERMITS:**

The following permits have been or will be obtained prior to the start of work. Contractor is responsible for familiarizing himself with the conditions of these permits and conducting all work in accordance with these permits:

- 1) NH DES Wetlands Bureau Permit.
- 2) Army Corps of Engineers SPGP Permit.

The Contractor shall obtain all permits required by local, state and federal governing authorities for removal and disposal of all demolition materials. The Contractor must obtain a project permit from New Hampshire Department of Transportation for either bid option (form attached, no fee required).

### **B. UTILITIES:**

The Contractor shall send proper notices, make necessary arrangements and perform all other Service required for the removal or the care, protection, and maintenance of utilities, including, but not limited to: water, drainage, electric, telephone, wires, and all other items of this character above or below ground, on and around the site, assuming all responsibility and paying all costs related thereto. Related Service to any existing facilities shall not be disrupted without the prior approval of the Owner, and then only to the minimum extent required. The Contractor shall call *Digsafe at least 72 working day hours* in advance of any excavation, demolition, clearing/grubbing or other ground disturbance.

The Contractor shall comply with TOWN OF SEABROOK ordinances, rules and regulations.

### **C. JOB SITE LAYOUT, CONDITIONS AND MEASUREMENTS:**

Contractor shall determine all lines and grades and field verify existing job conditions and measurements shown on the drawings. All discrepancies shall be reported to the Engineer for clarification. No additional compensation will be made to the Contractor for any error or negligence neither on its part, nor for discrepancies between actual conditions found at the site and as indicated in the Contract Documents after the work has commenced.

D. ROADS AND ACCESS TO THE SITE:

Access to the site for workmen and the delivery or removal of construction materials and/or equipment shall be made only from locations approved by the Owner. Existing roads shall remain accessible to vehicles at all times, unless temporary closures are scheduled in advance with the Owner. Contractor shall obtain hauling permits and route approvals from governing authorities as applicable.

E. MUD & DUST CONTROL:

- 1) Contractor shall continuously implement a mud & dust control program to minimize dust generation and prevent tracking of mud onto roadways.

F. DEWATERING:

- 1) The Contractor shall protect the work, including but not limited to dewatering operations.
  - a) Furnishing, operating and maintaining all pumps, piping, drains and other equipment, including spare units available for immediate use in the event of equipment breakdowns.
  - b) Designing, constructing, maintaining and removing containment berms, cofferdams, temporary under drains and all other systems necessary for dewatering.
  - c) Dispose of all water in a safe and proper manner, acceptable to governing authorities. Pumped water shall be discharged into a suitable settling or filtering area/bag provided by the contractor, and shall not be directly discharged into the pond or catch basins.
- 2) The Contractor shall pay all costs related to dewatering. All damage resulting from dewatering operations, or the failure of the Contractor to maintain the work in a suitable dry condition, shall be promptly repaired by the Contractor at no additional cost to the Owner. The Contractor is responsible to restore the dewatering/pond access area to original condition at no additional cost prior to final payment.

G. RECORD DRAWINGS:

- 1) Contractor shall submit Record Drawings of all work on paper in a format acceptable to the Owner and Engineer upon project completion and prior to final payment.

H. TRAFFIC REGULATIONS AND PARKING:

- 1) The Contractor shall provide adequate personnel, flagmen, signs, barricades and equipment to properly regulate traffic at times when the work interferes with the normal flow of traffic both on and off the site. Parking for workmen and construction vehicles shall be within the easement area and be limited to areas designated by the Owner. Parking areas and roadways outside the limits of the contract shall be kept free of debris resulting from construction related traffic. If at any time the Engineer or the Town of Seabrook determines that additional traffic control personnel are required to execute the work, the Contractor shall provide additional personnel at no additional cost.

**1.6 EXTRA WORK**

A. CLASSIFICATION OF EXCAVATION:

- 1) Subgrade soils, which are determined by the Engineer to have satisfactory bearing capacity shall be prepared and covered with the required compacted crushed stone layer on the same day as the finish excavation. Over excavation of subgrade soils, or failure to protect subgrade soil which become loose and saturated after they are exposed will not be measured or paid for as extra work.
- 2) The Engineer shall be the sole judge as to whether material encountered shall be classified as unsuitable for reuse in accordance with the above descriptions.

B. CLASSIFICATION OF FILL:

- 1) Shall meet the requirements of Section 02200 – Earthwork.

C. MEASUREMENT & PAYMENT:

- 1) Unsuitable Structure Excavation:
  - a) The Contractor shall assume in the base bid that all material excavated below topsoil level, necessary to complete this work, will be unsuitable for reuse as backfill and shall be

removed. Fill material to replace this unsuitable material removed shall not be measured or paid for separately and shall be included in the base bid (unless the unit price bid option is selected).

- b) If the existing subsurface below the level of preparation is determined by the Engineer at the time of excavation to have inadequate bearing capacity, it shall be considered a changed condition, subject to the changed condition terms of the contract.

- End of Section -

## **SECTION 02050**

### **REMOVALS**

#### **PART 1.0 - GENERAL**

##### **1.1 REFERENCES**

- A. Refer to other divisions of these specifications, other sections in this division, and drawings for related work, which may affect the work of this section.
- B. The Contract Drawings indicate and show limits of construction for this project. These specifications specify material and work requirements for this project. Both are complementary to each other, and both shall be followed to properly complete the work.

##### **1.2 SCOPE**

- A. The work of this section consists of the removal, including legal disposal of materials shown to be removed on the drawings as required for removal work, new construction, or relocation.

##### **1.3 JOB CONDITIONS**

- A. The Contractor shall inspect the premises prior to submittal of its proposal for verification of existing conditions, which will affect its work.
- B. Provide necessary protection to ensure the safe passage of persons around the area of removals. Conduct operations to prevent damage to adjacent buildings, structures, and other facilities as well as persons.
- C. Promptly repair damages caused to adjacent facilities by removal operations, as directed by the Owner and at no cost to the Owner.

##### **1.4 PERMITS**

- A. The Contractor shall obtain all permits required by local, state and federal governing authorities for removal and disposal of all removal materials.

##### **1.5 DISPOSAL OF REMOVED MATERIALS**

- A. At regular intervals, remove from the site all debris, rubbish, and other materials resulting from removal operations, and legally dispose of off the site. Storage or sale of removed materials to be removed will not be permitted on the site.

- B. Burning of removed materials will not be permitted on the site.
- C. Any removal materials, that are temporarily stored on site shall be protected from erosion and from causing sedimentation.
- D. Carefully remove, retain and store on-site in a protected area under cover any items indicated to be salvaged, reused, or reinstalled.

## **1.6 CLEANING-UP**

- A. Clean adjacent structures and improvements of all mud, dust, dirt, and debris caused by removal operations, as directed by Owner.
- B. Return remaining adjacent areas to existing condition prior to the start of removal work.

## **PART 2.0 - MATERIALS**

### **2.1 REMOVALS SCHEDULE**

- A. Removals include, but may not be limited to, removal and/or salvage of the following materials, structures, systems, etc., as indicated on the drawings:  
Removals:
  - 1) Existing concrete, timber, pavement indicated to be removed within work areas.
  - 2) Existing surplus or unsuitable stone & unsuitable soil, or soil specified for removal.
  - 3) Existing Incidental items, such as existing concrete, metals, fabrics, old silt fencing, timber, trees/shrubs/vegetation, etc.Salvage/reinstall:
  - 1) Existing signs
  - 2) Existing site features, signs, fences, etc.

## **PART 3.0 - EXECUTION**

### **3.1 DETAILS OF WORK**

- A. All removal materials shall be taken from the site by the Contractor and unless otherwise noted or directed by the Owner, will become its property. None of the removal materials shall be reused in the new permanent construction unless specifically noted on the plans or specifications or approved in writing by the Owner. All materials removed from the site shall be legally disposed of.

B. Existing items salvaged for reuse shall be handled and stored carefully with adequate contractor indexing for reinstallation. The stored materials shall be protected from theft. Reinstall these items in the same locations in-kind, unless otherwise specified.

C. The Contractor shall provide adequate construction fencing for protection of the area and monitoring of construction fence openings to ensure the public does not enter the construction/work areas.

- End of Section -

## **SECTION 02200**

### **EARTHWORK**

#### **PART 1.0 GENERAL**

##### **1.1 GENERAL REQUIREMENTS**

- A. Refer to other divisions of these specifications, other sections in this division, and drawings for related work, which may affect the work of this section.
- B. The Contract Drawings indicate limits of construction for this project. These specifications specify material and work requirements for this project. Both are complementary to each other and both shall be followed to properly complete the work.

##### **1.2 SCOPE OF WORK**

- A. Provide labor, materials, equipment, and service, etc. and perform all operations necessary for earthwork required for the execution of all construction as indicated on the drawings, specified herein or otherwise required for a complete and proper job.
- B. Without limiting the generality thereof, the scope of work under this section shall include, but shall not necessarily be limited to, the following items:
  - 1) Excavation and stockpiling of materials suitable for reuse in an on-site location approved by the Owner.
  - 2) Removing existing material and replacing that material in a suitable manner in accordance with the requirements of the plans.
  - 3) Removal and offsite disposal of existing pavements, concrete, and incidentals which may be encountered and backfilling to the grades shown on the plans.
  - 4) Excavation, fill, refill, backfill, subgrade preparation and compaction as indicated or required, including, but not necessarily limited to, all work related to utilities, pavements, yards, as well as general earthwork.
  - 5) Excavation to subgrade limits and disposal of unsuitable or excess soil materials.
  - 6) Proof compacting subgrade.



- 7) Protection of excavated subgrade areas including diverting surface runoff from excavations. (Note: Subgrade soils, which become wet or unstable after excavation, shall be replaced with crushed stone underlain with a non-woven geotextile fabric. This work is considered subsidiary and will not be paid for as extra work).
- 8) Base and sub-base course material under pavements, including compaction.
- 9) Rough and finish grading.
- 10) Dewatering and control of water for all construction operations.
- 11) Protection of existing structures, pavements, utilities, etc. to remain.
- 12) Dust, erosion, situation and environmental controls.
- 13) Sheet piling, shoring and bracing of all excavations and as otherwise necessary.

### **1.3 LAW AND REGULATIONS**

- A. All work shall be accomplished in accordance with regulations of local, county and state agencies and national or utility company standards as they apply.

### **1.4 SITE INVESTIGATION**

- A. The Contractor acknowledges that it has satisfied itself as to the nature and location of the work, the general and local conditions, particularly those bearing upon transportation, disposal, handling, and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, ground water table or similar physical conditions at the site, the confirmation of subsurface materials to be encountered, the character of equipment and facilities needed prior to and during the prosecution of the work and all other matters which can in any way affect the work or the cost thereof under this contract. Any failure by the Contractor to acquaint itself with all information concerning these conditions will not relieve it from responsibility for estimating properly the difficulty or cost of successfully performing the work.

## **1.5 JOB CONDITIONS**

### **A. Mud & Dust Control**

Use all means necessary to control mud and dust on and near the work and on and near all off-site borrow areas if such mud/dust is caused by the Contractor's operations during performance of the work or if resulting from the condition in which the Contractor leaves the site. Thoroughly moisten all surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the site. Areas to be left undisturbed for more than two (2) days or when rains are forecast, shall be temporarily stabilized with a suitable covering.

### **B. Protection**

Use all means necessary to protect all materials of this section before, during, and after installation and to protect all objects designated to remain. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

### **C. Bracing**

Properly support all trenches and all other excavations in strict accordance with all pertinent rules and regulations. Brace, sheet, and support trench walls and other excavations in such a manner that they will be safe and that the ground alongside the excavation will not slide or settle, and that all existing improvements of every kind, whether on public or private property, will be fully protected from damage. In the event of damage to such improvements, immediately make all repairs and replacements necessary to the approval of the Engineer and at no additional cost to the Owner.

## **PART 2.0 - PRODUCTS**

### **2.1 FILL MATERIAL, GENERAL**

#### **A. Approval Required**

All fill material shall be subject to the review of the Engineer. Qualified materials shall not change in source or character unless re-qualified. The Engineer review of a material shall not in any way diminish the Contractor's responsibility to fulfill all requirements of the specifications.

## **2.2 FILL MATERIAL**

A. Crushed Stone

The material shall consist of crushed stone, free from clay, loam, or organic matter and shall conform to NHDOT SSRBC "Crushed Stone (course)" Item 304.5.

B. Structural Fill

The material shall consist of crushed gravel free from clay, loam, or organic matter and shall conform to NHDOT SSRBC "Crushed Gravel", Item 304.3.

C. Topsoil

Topsoil shall consist of loose friable topsoil with no admixture of refuse or material toxic to plant growth. Topsoil shall be generally free from stones, lumps, stumps, or similar objects larger than one (1) inch in greatest diameter or length, subsoil, roots and weeds. The term as used herein shall mean that portion of the soil profile defined technically as the "A" horizon by the Soil Science Society of America. The minimum and maximum pH value shall be from 5.5 to 7.6. Topsoil shall contain a minimum of three (3) percent and a maximum of ten (10) percent of organic matter as determined by loss by ignition. Not more than sixty-five (65) percent shall pass a No. 200 sieve as determined by the wash test in accordance with ASTM D 1140. In no instance shall more than 20% of that material passing the No. 4 sieve consist of clay size particles.

D. Seed

A grass seed mixture containing the following seed requirements shall be used.

Ryegrass shall be a certified fine-textured variety such as Pennfine, Fiesta, Yorkcity, Diplomat or equal, with minimum germination rate of at least 85% and min. 95% purity.

E. Riprap

Hard durable angular stone riprap with stone sizes from 6" to 12" nominal size.

## **2.3 USE OF MATERIAL**

A. Crushed Stone

Material meeting at least the minimum requirements of crushed stone specified herein shall be used as a stabilizing layer for excavation back

slope, under structures, around pipes and around structures, also for saturated areas at or below the water table and as bedding material for construction.

## **PART 3.0 EXECUTION**

### **3.1 GENERAL**

#### **A. Familiarization**

Prior to all work of this section, the Contractor shall become thoroughly familiar with the site, the building and site conditions, and all portions of the work covered by this section. The Contractor shall satisfy itself, by actual examination of the site of the work, as to the existing conditions, contours and the elevations and the amount of work required under this section.

#### **B. Conditions**

The Contractor acknowledges that it has satisfied itself as to the nature and location of the work the general and local conditions, particularly those bearing upon site access and transportation, disposal, handling, and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, ground water table, or similar physical conditions at the site, the conformation and subsurface materials to be encountered, the character of equipment and facilities needed prior to and during the prosecution of the work and facilities needed prior to and during the prosecution of the work and all other matters which can in any way affect the work or the cost thereof under this contract.

Any failure by the Contractor to acquaint itself with all available information concerning these conditions will not relieve him from responsibility for estimating properly the difficulty and cost of successfully performing the work.

#### **C. Protection**

The Contractor shall protect existing utilities, the location of which may be shown approximately on the drawings, or which are located in the field by the Contractor or others. Utilities whose location is not known shall be protected insofar as possible. All costs for repair of utilities broken or damaged by the Contractor or its subcontractors shall be the responsibility of the Contractor.

D. Inspection and Tests

Do not allow or cause any of the work performed or installed to be covered up or enclosed by work of this section prior to all required inspections, tests, and approvals. Should any of the work be so enclosed or covered up before it has been approved, uncover all such work at no additional cost to the Owner. After the work has been completely tested, inspected and approved, make all repairs and replacements necessary to restore the work to the condition in which it was found at the time of uncovering, all at no additional cost to the Owner.

**3.2 STRIPPING UNSUITABLE OR EXCESS MATERIALS**

- A. All unsuitable or excess materials shall be stripped to subgrade limits from areas of new construction or regrading. Materials suitable for reuse shall be stored in locations designated by the owner. Excess soil materials and all soil materials not suitable for reuse shall be disposed of off-site. All excavations shall be performed in a manner to minimize the disturbance of underlying natural ground to remain and existing structures to remain.
- B. The Contractor shall excavate unsuitable material below subgrade limits (18" max) to specified grades or to suitable subgrade soils in structure and pavement areas in the manner specified below as directed by the Engineer. The Engineer shall determine unsuitable materials to be any material having an unsatisfactory bearing capacity.
- C. The Contractor shall follow a construction procedure, which permits visual identification of subgrade soils. When water is encountered, the size of the open excavation shall be limited to that which can be handled by the Contractor's chosen method of dewatering and allow visual observation of the bottom and placement of crushed stone and backfill in the dry.
- D. If subgrade soils become unstable after they have been exposed, the Contractor may be required to over excavate and backfill with compacted structural fill or crushed stone underlain by geotextile fabric to stabilize areas which may become disturbed due to surface runoff. This work is considered part of the base bid and will not be paid for as extra work.
- E. Over Excavation Correction

Excavation beyond indicated or authorized limits shall be refilled with approved select fill or other approved suitable granular soil material. Refills shall be compacted to 95 percent (Modified Proctor) of the maximum dry density at optimum moisture content. Refills shall be

provided as required by the Engineer and at no additional cost to the Owner.

### **3.3 GRADES AND ELEVATIONS**

- A. The alignment, finished grades & elevations of the site shall be consistent with existing grades and elevations. The Engineer, however, may make such adjustments in grades and alignments as are found necessary in order to improve drainage, match existing elevations and other special conditions encountered. Grading between indicated final grades shall provide smooth, even surfaces, except as otherwise required.

### **3.4 SHEETING, SHORING AND BRACING**

- A. Provide shoring, sheeting, and/or bracing of excavations as required to assure complete safety against collapse of earth at side of excavations. Alternatively, lay back excavations to a stable slope and armor the exposed backslope with at least 4" of crushed stone.
- B. Excavations shall be adequately sheeted, shored and braced as necessary to permit proper execution of the work and to protect all slopes and earth banks. Sheet piling shall be installed if required to prevent cave-ins or settlement and to protect workmen. Shoring and bracing may be removed as the backfilling progresses, but only when banks are safe against caving, taking all necessary precautions to prevent collapse of excavation sides.
  - 1) In removing sheeting or bracing, all necessary precautions shall be taken to prevent voids and collapse of excavation sides. Voids, if formed, shall immediately be filled with gravel and then compacted.
  - 2) The installation of sheeting, shoring, and bracing shall comply with the safety precautions as outlined in the Associated General Contractors of America "Manual of Accident Prevention in Construction," and all local and state regulations. Dewatering shall be performed as required or as directed by the Engineer for all excavations below ground water level.
- C. Comply with local and state safety regulations and with the provisions of the Occupational Safety and Health Act (OSHA).

### **3.5 PLACING SITE FILL**

- A. Base courses shall be made with materials indicated on the drawings, and specified in the Specifications.

- B. Frost
- 1) Do not excavate to full indicated depth when freezing temperatures may be expected, unless fill material or structures can be constructed immediately after the excavation has been completed, or the ground can be protected from freezing with insulating blankets and/or a ground heater. Protect the excavation from frost if placing of fill or structure is delayed.
  - 2) Fill shall not be placed over frozen soil. Soil that is frozen shall be removed prior to placement of compacted fill. Remove all frozen uncompacted soil prior to placing additional fill for compaction.
- C. Protect fill area by grading to drain and providing a smooth surface which will readily shed water. Grade the surface of the areas in such a manner as to prevent ponding of surface runoff water in areas to receive compacted fill.
- D. To the extent that it is practicable, each layer of fill shall be compacted to the specified density the same day it is placed.
- E. All fill materials shall be spread uniformly by acceptable methods over the areas required to be covered so that the required thickness after compaction shall be obtained. The material shall be thoroughly consolidated by vibratory tampers, hand tamping or other approved means, to the final compacted grades as required. In no case shall the fill materials be placed in excess of six (6) inches for each lift before compaction, unless otherwise approved by the Engineer.

### **3.6 SOILS OBSERVATION**

- A. The Engineer may perform on-site observations during this phase of the construction operations. The Service of the Engineer may include, but not be limited to, the following:
- 1) Observations during excavation and dewatering within the drainage area and the slope to be covered with surface treatment.
  - 2) Observations during backfilling and compacting operations within that area defined.
  - 3) The field observations performed by the Engineer and its presence do not include supervision or direction of the actual work by the Contractor, its employees, or agents. Neither the presence of the Engineer nor any observations performed by him shall

excuse the Contractor from meeting the soils and compaction requirements as specified or correcting any defect in its work.

### **3.7 COMPACTION**

- A. Fills, refills and backfills within the new pavement areas and the various areas listed below shall be compacted to not less than the following specified maximum dry densities as determined by ASTM D-1557.
- B. Compaction Requirements
- | <u>Areas</u>                  | <u>Minimum Degree of Compaction</u> |
|-------------------------------|-------------------------------------|
| 1) Pavement Base and Subbase  | 95%                                 |
| 2) Below Unpaved Areas        | 95%                                 |
| 4) Base and Backfill Material | 95%                                 |
- C. Methods: The compaction guidelines given below are stated to provide minimum compaction standards only and in no way relieves the Contractor of its obligation to achieve the above specified degree of compaction by whatever additional effort is necessary.
- D. All percentages of compaction specified herein shall be related to the maximum dry density at the optimum moisture content as established by ASTM Test Method D1557, according to ASTM Test Methods D1556, D2922 or D2167. Prior to placing, at least one representative sample of each of the fill materials proposed to be furnished for the earthwork operations to determine gradation and moisture density characteristics.
- E. No rolling equipment shall be used to compact materials within twelve (12) feet of the vertical faces of any structures, walls or utility pipes. Plate vibratory tampers shall be used in these restricted areas and in other areas too confined to satisfactorily use rolling equipment.

### **3.8 GRADING**

- A. General
- Perform all rough and finish grading required to attain the elevations shown on the drawings, or as otherwise directed by the Engineer or required for a complete and proper job.
- B. Rough Grading
- Proper allowances shall be made for paving, or other finish surfaces. Rough grading shall be reasonably even and free from irregularities, and



shall provide positive drainage away from structures without ditching or pools.

C. Fine Grading

Any depressions, which may occur, shall then be filled with additional suitable materials and the surface then regraded until true to the lines and grade required. Areas to be fine graded for loaming and seeding shall be raked to remove all stones and other unsatisfactory materials and shall be suitably compacted. Apply topsoil at a minimum 4" thick rolled thickness. All large stiff clods, lumps, brush, roots, debris, glass, stumps, litter and other foreign material as well as stones over one (1) inch in diameter or length shall be removed from the topsoil and disposed of as specified.

D. Treatment After Completion of Grading

After grading and fine grading (including topsoil) is completed, permit no further excavating, filling, or grading. Use all means necessary to prevent erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed. Scarify surface and uniformly apply specified seed at a rate of 100 pounds per acre and apply a fine layer of hay mulch (or hydro seed).

### **3.9 DUST, EROSION AND ENVIRONMENTAL CONTROLS**

- A. Mud & dust control shall be maintained constantly throughout the construction period by approved method. Water may be used for dust control and applied by sprinkling with water trucks with distributors for that purpose as required or directed by the Engineer to maintain dust control.
- B. The Contractor shall be responsible for exercising every precaution to prevent erosion and siltation of lower elevations and existing drainage systems and watercourses throughout the construction period. All damage caused by inadequate erosion control measures shall be repaired at the Contractor's expense. Erosion control and siltation of lower elevations and existing drainage systems shall be effectively controlled by the construction and continual use of baled hay or straw, or filter fabric barriers as shown on drawings and as directed by the Engineer.
- C. All environmental controls shall be performed in accordance with all applicable rules and regulations of local, county and state agencies having jurisdiction.

- End of Section

## **SECTION 02700**

### **STORM DRAINAGE**

#### **PART 1.0 - GENERAL**

##### **1.1 SCOPE OF WORK**

- A. Without limiting the generality thereof, the work under this section consists of furnishing all labor, equipment, supplies, services and materials and performing all operations in connection with the installation of the storm drainage system, including piping, pipe fittings, slope stabilization and shaping an exit swale at the outfall and related work required for the storm drainage system as indicated on the drawings and as specified herein to create a functioning flowing system.

##### **1.2 LAWS AND REGULATIONS**

- A. All work shall be accomplished in accordance with regulations of local, county and state agencies as they apply.
- B. Secure all necessary permits from municipal, county and state departments having jurisdiction prior to the start of construction and furnish proof of acceptance upon completion of the work.

##### **1.3 GRADES AND ELEVATIONS**

- A. The drawings indicate the alignment, invert and finished grade elevations of all structures and utilities. The Engineer, however, may make such adjustments in grades and alignment as are found necessary in order to avoid interference and to adapt the utilities and piping to other special conditions encountered.

##### **1.4 SUBMITTALS**

- A. Submit catalog cuts showing specification compliance for all storm drainage items, described or indicated on the drawings, including pipe, precast structures, frames, covers, grout for approval prior to ordering.

## **PART 2.0 - PRODUCTS**

### **2.1 PRODUCTS**

- A. Piping for site drainage work shall be of the following materials:
- 1) PVC Pipe SDR-35  
ASTM D3034 with neoprene gaskets
  - 2) Ductile Iron Pipe  
ASTM A74 service weight or heavier with neoprene gaskets
  - 3) Reinforced Concrete Pipe (Type II Portland Cement) for outfall only  
This pipe shall conform to the requirements of AASHTO M170, Wall B, Class III or better or ASTM C76, Class III or better.
- B. Precast concrete manholes/dry well  
NHDOT Section 520 AA Portland cement concrete using Type II cement, max. water cement ratio 0.40; or equivalent. The tricalcium aluminate (C<sub>3</sub>A) content in the cement shall not be less than 4 percent to provide protection for the reinforcement and shall not be more than 10 percent to obtain concrete that is resistant to sulfate attack. Design load for H-20 or HS-20 truck loading.
- C. Manhole frames and covers  
Cast iron New Hampshire standard 32" (30" clear opening), cover marked "DRAIN", such as EJ PRESCOTT #30 LA326-4 or equal. Design load for H-20 or HS-20 truck loading.
- D. Non-shrink grout  
Non-shrink non-metallic grout (no volume decrease) grout obtaining a minimum 28 day compression strength of 5,000 psi, conforming to ASTM C 1107. The grout shall be formulated consistent with the surface orientation and application.
- E. Brick  
Solid water struck face clay brick.

Formatted: Bullets and Numbering

## **PART 3.0 - EXECUTION**

### **3.1 CONSTRUCTION**

- A. Site and Trench Excavation, Fill and Backfill
- 1) Trench widths shall be sufficient to permit proper installation of the work and bottoms of trenches shall be evenly graded. Excavations below required depths shall be refilled with crushed stone and compacted. Immediately after trench excavations have been

carried to the required grades, the exposed surface of the existing bottom shall be cleaned of all loose disturbed materials. Where the trench bottom is below the water level or within saturated earth materials, bedding below the storm drain shall be made with a minimum of twelve (12) inches of crushed stone. Pipe beds in bedding material shall be rounded to accommodate the bottom quadrant of the pipe and to provide full support and uniform bearing for the entire length of the pipe barrel.

- 2) Control and pitch the grading to prevent water from running into the excavated areas of the site or drain, or to prevent damage to other structures or work already accomplished.
- 3) Furnish all pumping and other dewatering equipment necessary to keep excavated areas dry during construction. Water shall not be conducted onto adjacent property except in existing watercourses.
- 4) After piping and structures have been installed, tested, inspected and approved by the Engineer, crushed stone bedding material as specified shall be carefully hand placed and hand tamped in six (6) inch layers, under, around and to the spring line of the pipe. The remaining excavation shall be backfilled with crushed stone, compacted in one (1) foot layers loose measure.
- 5) Obtain information from the proper authorities concerning locations of existing utilities within the scope of this work in order to avoid damage to such utilities. The Owner will not be responsible for utility investigations, research or resulting damage caused by the Contractor. Restore any structure and repair any resultant damage without additional cost to the Owner.
  - a) Rules and regulations governing the respective utilities shall be observed. Active utilities shall be adequately protected from damage and shall not be removed or relocated except as indicated or directed. Inactive and abandoned utilities shall be reported in writing to the Engineer and shall be removed, plugged or capped as directed.
- 6) Excavations shall be adequately sheeted, shored and braced as necessary to permit proper execution of the work and to protect all slopes and earth banks. Shoring and piling may be removed as the backfilling progresses, but only when banks are safe against caving.
- 7) Excavation of earth, boulders or rock beyond indicated or authorized limits shall be refilled at no additional expense to the

Owner with gravel compacted to 95 percent of the maximum dry density at optimum moisture content, or crushed stone, as required by the Engineer.

- 8) Brickwork shall be stretcher bond in a neat uniform manner with concave tooled joints.
- 9) Concrete slab shall be screeded, floated and have a medium broom finish.

- End of Section -

## **SECTION 03300**

### **CONCRETE**

#### **PART 1 - GENERAL**

##### **1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

##### ACI INTERNATIONAL (ACI)

ACI 301	Structural Concrete
ACI 304R	Measuring, Mixing, Transporting, and Placing Concrete
ACI 304.2R	Placing Concrete by Pumping Methods
ACI 305R	Hot Weather Concreting
ACI 306.1	Cold Weather Concreting
ACI 308	Curing Concrete
ACI 309R	Consolidation of Concrete
ACI 315	Details and Detailing of Concrete Reinforcement
ACI SP-2	ACI Manual of Concrete Inspection

##### AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 615	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 706	Low-Alloy Steel Deformed Bars for Concrete Reinforcement
ASTM C 31	Making and Curing Concrete Test Specimens in the Field
ASTM C 33	Concrete Aggregates
ASTM C 39	Compressive Strength of Cylindrical Concrete Specimens
ASTM C 94	Ready-Mixed Concrete
ASTM C 150	Portland Cement
ASTM C 260	Air-Entraining Admixtures for Concrete
ASTM C 920	Elastomeric Joint Sealants
ASTM C 989	Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars
ASTM C 1107	Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM C 1240	Silica Fume for Use in Hydraulic-Cement Concrete and Mortar

## **1.2 DEFINITIONS**

- a. "Blending size" is an aggregate that complies with the quality requirements in ASTM C 33 and paragraph entitled "Aggregates" and as modified herein and can be blended with coarse and fine aggregate to produce a well graded combined grading.
- b. "Cementitious material" as used herein shall include portland cement, pozzolan, fly ash, ground granulated blast-furnace slag, and silica fume.
- c. "Design strength" ( $f'_c$ ) is the specified compressive strength of concrete to meet structural design criteria.
- d. "Mixture proportioning" is a description of the proportions of a concrete mixture that were selected to enable it to meet the performance durability requirements, constructability requirements, and the initial and life-cycle cost goals.
- e. "Mixture proportions" is the concrete supplier's by-mass proportions to replicate the mixture design.
- f. "Pozzolan" is a silicious or silicious and aluminous material, which in itself possesses little or no cementitious value but will, in finely divided form and in the presence of moisture, chemically react with calcium hydroxide at ordinary temperatures to form compounds possessing cementitious properties.
- g. "Field test strength" ( $f_{cr}$ ) is the required compressive strength of concrete to meet structural and durability criteria. Determine ( $f_{cr}$ ) during mixture proportioning process.

## **1.3 SUBMITTALS**

Submit the following:

Design Data

Mixture designs

## **1.4 MODIFICATION OF REFERENCES**

Accomplish work in accordance with ACI publications except as modified herein. Consider the advisory or recommended provisions to be mandatory, as though the word "shall" had been substituted for the words "should" or "could" or "may," wherever they appear. Interpret reference to the "Building Official," the "Structural Engineer," and the "Architect/Engineer" to mean the Engineer.

## **1.5 DELIVERY, STORAGE, AND HANDLING**

Do not deliver concrete until, forms, reinforcement, embedded items, and reinforcement connections are in place and ready for concrete placement. ACI 301 and ASTM A 934 for job site storage of materials. Store reinforcement of different sizes and shapes in separate piles or racks raised above the ground. Protect materials from contaminants such as grease, oil, and dirt. Ensure materials can be accurately identified after bundles are broken and tags removed.

### **1.5.1 PLACING CONCRETE**

Concrete shall be deposited by chute, bucket or concrete pump. The methods and equipment used shall be subject to approval.

## **1.6 QUALITY ASSURANCE**

### **1.6.1 Concrete Mixture Design**

At least 7 days prior to concrete placement, submit proportions for a concrete mixture. Submit a complete list of materials including type; brand; source and amount of cement, aggregate, fly ash, (or slag pozzolans), silica fume, ground slag; and applicable reference specifications. Submit additional data regarding concrete aggregates if the source of aggregate changes. Submittal shall clearly indicate the project and addition of fiber reinforcement.

### **1.6.2 Concrete Placement**

- a. Submit a list of equipment and methods proposed for use in placing concrete. Include pumping or conveying equipment including type, size and material for pipe, and the maximum length and height concrete will be pumped. No field adjustments shall be made to the approved mixture design to facilitate pumping, so modifications in mix design for pumped concrete must be proposed in an option mix design.

## **PART 2 - PRODUCTS**

### **2.1 CONCRETE**

#### **2.1.1 Durability and Strength**

Provide a NHDOT standard AA concrete mix with a maximum water/cement ratio of 0.40 and 5 to 9% air content, fiber reinforcement and 28-day design strength to produce concrete of minimum design strength (f'c) of 4000 psi.



## **2.2 MATERIALS**

### **2.2.1 Cement**

ASTM C 150    ASTM C 595  
Portland       Blended

Type I	Type IP or IS	For general use in construction.
Type II	Type IP(MS) or Type IS(MS) Type II (LA) Type II (LH)	For general use in construction where concrete is exposed to moderate sulfate or alkali action or where moderate heat of hydration is required. ASTM C 595 (blended hydraulic cements): add the suffix MS or MH where either moderate sulfate resistance or moderate heat of hydration, respectively, is required.
Type III	None	Not permitted

ASTM C 150, Type II and/or ASTM C 595, Type IP(MS) or IS(MS) and ASTM C 1157, Type MS blended cement except as modified herein. The tricalcium aluminate ( $C_3A$ ) content shall not be less than 4 percent to provide protection for the reinforcement and shall not be more than 10 percent to obtain concrete that is resistant to sulfate attack. Blended cements shall consist of a mixture of ASTM C 150 cement and one of the following materials: ASTM C 618 pozzolan or fly ash, or ASTM C 989 ground granulated blast-furnace slag. Use one manufacturer for each type of cement, ground slag, fly ash, and pozzolan.

#### **2.2.1.1 Fly Ash and Pozzolan**

ASTM C 618, Type F, except that the maximum allowable loss on ignition shall be 6 percent for Types F. Add with cement, if selected.

#### **2.2.1.2 Ground Iron Blast-Furnace Slag**

ASTM C 989, Grade 120, if selected.

#### **2.2.1.3 Silica Fume**

ASTM C 1240, if selected.

### **2.2.2 Water**

Water shall comply with the requirements and Table 2 optional requirements of ASTM C 94 and the chloride and sulfate limits in accordance with ASTM D 512 and ASTM D 516. Mixing water shall not contain more than 500 parts per million of chlorides as Cl and not more than 100 parts per million of sulfates as  $SO_4$ . Water shall be free from injurious amounts of oils, acids, alkalies, salts, and organic materials.

### 2.2.3 Aggregates

ASTM C 33, except as modified herein.

a. The combined aggregates in the mixture (coarse, fine, and blending sizes) shall be well graded from the coarsest to the finest with not more than 18 percent nor less than 8 percent, unless otherwise permitted, of the combined aggregate retained on any individual sieve with the exceptions that the No. 50 may have less than 8 percent retained, sieves finer than No. 50 shall have less than 8 percent retained, and the coarsest sieve may have less than 8 percent retained. Use blending sizes where necessary, to provide a well graded combined aggregate. Reports of individual aggregates shall include standard concrete aggregate sieve sizes including 1 1/2 inches, one inch, 3/4 inch, 1/2 inch, 3/8 inch, No. 4, No. 8, No. 16, No. 30, No. 50, and No. 100.

b. Provide aggregates for exposed concrete from a consistent source, ASTM C 227. Do not provide aggregates that react deleteriously with alkalis in cement. Refer to appendix, paragraph entitled "Test Method C227" of ASTM C 33 for expansion limits. Provide aggregate containing no deleterious material properties as identified by ASTM C 295.

c. Where a size designation is indicated, that designation indicates the nominal maximum size of the coarse aggregate. The largest feasible nominal maximum size aggregate specified in ASTM C 33, Class 4S shall be used. However, nominal maximum size of aggregate shall not exceed any of the following: three-fourths of the minimum cover for reinforcing bars, three-fourths of the minimum clear spacing between reinforcing bars, one-fifth of the narrowest dimension between sides of forms, or one-third of the thickness of slabs or toppings.

d. Aggregate may contain materials deleteriously reactive with alkalis in the cement, if cement contains less than 0.60 percent alkalis (percent Na<sub>2</sub>O plus .658 percent K<sub>2</sub>O). Provide a material such as fly ash, slag, or silica fume as specified to be effective in preventing harmful expansion due to alkali-aggregate reaction by ASTM C 441.

e. Where historical data is used, provide aggregates from the same sources having the same size ranges as those used in the concrete represented by historical data.

### 2.2.4 Nonshrink Grout

A non-metallic non-shrink (no volume decrease) grout obtaining a minimum 7 day compression strength of 4,000 psi, conforming to ASTM C 1107. The grout shall be formulated consistent with the surface orientation and application.

### 2.2.5 Admixtures

- a. Provide chemical admixtures that comply with the requirements shown below and in accordance with manufacturer's recommendations, and appropriate for the climatic conditions and the construction needs. Do not use calcium chloride or admixtures containing chlorides from other than impurities from admixture ingredients.
- b. Provide minimal concentrations of corrosion-inducing chemicals as shown in Table 2 below.

Table 2 - Limits on Corrosion-Inducing Chemicals

Chemical*	Limits, Max. Percent**	Test Method
Chlorides	0.10	ASTM D 512
Fluorides	0.10	ASTM D 1179
Sulphites	0.13	ASTM D 1339
Nitrates	0.17	ASTM D 3867

\* Limits refer to water-soluble chemicals

\*\* Limits are expressed as a percentage of the mass of the total cementitious materials.

- c. The total alkali content shall not increase the total sodium-oxide equivalent alkali content of the concrete by more than 0.5 lb/yd<sup>3</sup>.

#### 2.2.5.1 Air Entraining Admixture

Provide air entraining admixtures conforming to ASTM C 260.

#### 2.2.5.2 Accelerating

ASTM C 494, Type C, if selected.

#### 2.2.5.3 Retarding

ASTM C 494, Type B, D, or G, if selected.

#### 2.2.5.4 Water Reducing

ASTM C 494, Type A, E, or F.

#### 2.2.5.5 High Range Water Reducer (HRWR)

ASTM C 494, Type F and ASTM C 1017.

### 2.2.6 Materials for Forms

Provide wood, plywood, plastic lumber or steel. Use plywood or steel forms where a smooth form finish is required. Hidden forms may be lower grade lumber or OSB. Form material shall be sufficiently flat and rigid to meet specified construction tolerances.

## 2.2.7 Reinforcement

### 2.2.7.1 Reinforcing Bars

ACI 301 unless otherwise specified. ASTM A 615. ASTM A 706 for bars to be welded.

## 2.2.8 Materials for Curing Concrete

### 2.2.8.1 Impervious Sheeting

ASTM C 171; waterproof paper, clear or white polyethylene sheeting, or polyethylene-coated burlap non-woven geotextile.

### 2.2.8.2 Pervious Sheeting

AASHTO M182.

### 2.2.8.3 Insulation

During freezing weather provide insulating blankets for all concrete less than 3 days old, when located above high water level.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION FOR PLACING CONCRETE**

Before commencing concrete placement, the following shall be performed. Surfaces to receive concrete shall be clean and free from frost, ice, mud, growth and water. Transporting and conveying equipment shall be in-place, ready for use, clean, and free of hardened concrete and foreign material. Equipment for consolidating concrete shall be at the placing site and in proper working order. Equipment and material for curing and for protecting concrete from weather or mechanical damage shall be at the placing site, in proper working condition and in sufficient amount for the entire placement. When hot, windy conditions during concreting appear probably, equipment and material shall be at the placing site to provide windbreaks, shading fogging, or other action to prevent plastic shrinkage cracking or other damaging drying of the concrete.

When placing footing concrete on bedrock, the bedrock shall be clean. If the bedrock surface is smooth and slopes offshore more than 2 in 12 over more than 6 linear feet of wall without surface shape to create a shear key, then a roughened rock surface shall be created by chipping or drilling /chipping or cutting chipping to form at least a 2" deep longitudinal keyway or 2" surface profile, prior to forming and placing concrete.

### **3.2 FORMS**

ACI 301. Set forms mortar-tight and true to line and grade. Below grade plywood forms may be left in place. After placing concrete, forms shall remain in place for at least 4 days. Prevent concrete damage during form removal.

Forms may be removed earlier than specified if high early strength concrete is used and that the concrete has reached sufficient strength to allow form removal without concrete damage.

### **3.3 PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS**

ACI 301. Remove rust, scale, oil, grease, clay, or foreign substances from reinforcing that would reduce the bond.

#### **3.3.1 Reinforcement Supports**

Reinforcement shall not be supported on organic materials or materials subject to deterioration.

#### **3.3.2 Splicing**

As indicated. For splices not indicated, ACI 301. Do not splice at points of maximum stress.

#### **3.3.3 Cover**

Concrete cover for reinforcement shall be 4 inches to reinforcing bars; unless otherwise noted.

#### **3.3.4 Construction & Control Joints**

Locate joints as approved by the Engineer to least impair strength and in a horizontal or inshore downward sloping arrangement. Continue reinforcement across joints unless otherwise indicated. Concrete surfaces at construction joints shall be rough (1/2" roughness) to enhance bond and shear friction.

### **3.4 BATCHING, MEASURING, MIXING, AND TRANSPORTING CONCRETE**

ASTM C 94, ACI 301, and ACI 304R, except as modified herein. Furnish mandatory batch tickets imprinted with mix identification, batch size, batch design and measured weights, moisture in the aggregates, and time batched for each load of ready mix concrete.

#### **3.4.1 Mixing**

ASTM C 94 and ACI 301. Machine mix concrete. Begin mixing within 30 minutes after the cement has been added to the aggregates. Place concrete within 90 minutes of either addition of mixing water to cement and aggregates or addition of cement to aggregates if the air temperature is less than 85 degrees F. Reduce mixing time and place concrete within 60 minutes if the air temperature is greater than 85 degrees F except as follows: if set retarding admixture is used and slump requirements can be met, limit for placing concrete may remain at 90 minutes. Additional water may be added, if both the specified maximum slump and water-cementitious material ratio are not exceeded. Field addition of water must be allowed

for in the mix design. When water is added, an additional 30 revolutions of the mixer at mixing speed is required. If time of discharge exceeds time required by ASTM C 94 concrete shall be rejected. If the entrained air content falls below the specified limit the concrete shall be rejected. Dissolve admixtures in the mixing water and mix in the drum to uniformly distribute the admixture throughout the batch.

#### 3.4.2 Transporting

Transport concrete from the mixer to the forms as rapidly as practicable. Prevent segregation or loss of ingredients. Clean transporting equipment thoroughly before each batch. Do not use aluminum pipe or chutes. Remove concrete which has segregated in transporting and dispose of as directed.

### **3.5 PLACING CONCRETE**

Place concrete as soon as practicable after the forms and the reinforcement have been inspected and approved. Do not place concrete when weather conditions prevent proper placement and consolidation; in uncovered areas during periods of precipitation; or in standing water unless otherwise approved. Prior to placing concrete, remove dirt, construction debris, water, snow, and ice from within the forms. Deposit concrete as close as practicable to the final position in the forms. Do not exceed a free vertical drop of 3 feet from the point of discharge. Place concrete in one continuous operation from one end of the structure towards the other or lifts for vertical construction.

#### 3.5.1 Vibration

Comply with the requirements of ACI 309R and ASTM A 934 using vibrators with a minimum frequency of 9000 vibrations per minute (VPM). Use only high cycle or high frequency vibrators. Motor-in-head 60 cycle vibrators may not be used. Provide a spare vibrator at the casting site whenever concrete is placed. Insert and withdraw vibrators approximately 18 inches apart. Penetrate at least 8 inches into the previously placed lift with the vibrator when more than one lift is required. Extract the vibrator using a series of up and down motions to drive the trapped air out of the concrete and from between the concrete and the forms.

#### 3.5.2 Pumping

ACI 304R and ACI 304.2R. Pumping shall not result in separation or loss of materials nor cause interruptions sufficient to permit loss of plasticity between successive increments. Loss of slump in pumping equipment shall not exceed 2 inches. Do not use pipe made of aluminum or aluminum alloy. Avoid rapid changes in pipe sizes. Limit maximum size of coarse aggregate to 33 percent of the diameter of the pipe. Maximum size of well rounded aggregate shall be limited to 40 percent of the pipe diameter. Discharge horizontally from pump hoses to avoid segregations and loss of air content. Take samples for testing at the discharge end.

### 3.5.3 Cold Weather

ACI 306.1. Do not allow concrete temperature to decrease below 50 degrees F. Obtain approval prior to placing concrete when ambient temperature is below 40 degrees F or when concrete is likely to be subjected to freezing temperatures within 24 hours. Cover and insulate concrete above tide level while curing during freezing weather.

### 3.5.4 Hot Weather

ACI 305R. Maintain required concrete temperature using Figure 2.1.5, "Effect of Concrete Temperatures, Relative Humidity, and Wind Velocity on the Rate of Evaporation of Surface Moisture From Concrete" in ACI 305R to prevent the evaporation rate from exceeding 0.2 pound of water per square foot of exposed concrete per hour. Cool ingredients before mixing or use other suitable means to control concrete temperature and prevent rapid drying of newly placed concrete. Shade the fresh concrete as soon as possible after placing. Start curing when the surface of the fresh concrete is sufficiently hard to permit curing without damage. Provide water hoses, pipes, spraying equipment, and water hauling equipment, where job site is remote to water source, to maintain a moist concrete surface throughout the curing period. Provide burlap cover or other suitable, permeable material with fog spray or continuous wetting of the concrete when weather conditions prevent the use of either liquid membrane curing compound or impervious sheets. For vertical surfaces, protect forms from direct sunlight and add water to top of structure once concrete is set.

## **3.6 SURFACE FINISHES**

### 3.6.1 Defects

Exposed surfaces shall be uniform in appearance and finished to a smooth form finish unless otherwise indicated.

## **3.8 CURING AND PROTECTION**

ACI 301 and ACI 308 unless otherwise specified. Prevent concrete from drying by misting surface of concrete and/or sheeting. Begin curing immediately following final set (typically within 1 hour). Avoid damage to concrete from vibration created by movement of equipment in the vicinity, disturbance of formwork or protruding reinforcement, by rain, waves or running water, adverse weather conditions, and any other activity resulting in ground vibrations. Protect concrete from injurious action by sun, rain, flowing water, frost, mechanical injury, tire marks, and oil stains. Do not allow concrete to dry out from time of placement until the expiration of the specified curing period. If forms are removed prior to the expiration of the curing period, provide another curing procedure specified herein for the remaining portion of the curing period.

Moist cure concrete using potable water for a minimum of 3 days. Begin curing within two hours of finishing. Protect concrete from premature drying, freezing,

excessively hot temperatures, and mechanical injury; and maintain minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete. The materials and methods of curing shall be subject to approval by the Engineer.

Concrete shall be cured for a minimum of 7 days, before removing shoring or applying loads.

### **3.9 FIELD QUALITY CONTROL**

#### **3.9.1 Evaluation of Mixture Designs**

- a. Submit supplier test results performed within the prior three months, showing that the same mix design has consistently met specification, including air content.

#### **3.9.2 Non-Destructive Tests**

Non-destructive tests may be used when to evaluate concrete if inspection suggests the in place concrete may not meeting the criteria.

End of Section



## **SECTION 04400**

### **STONE MASONRY**

#### **PART 1- GENERAL**

##### **1.1 REFERENCES**

- A. Refer to other divisions of these specifications, other sections in this division, and drawings for related work, which may affect the work of this section.
- B. The Contract Drawings indicate and show limits of construction for this project. These specifications specify material and work requirements for this project. Both are complementary to each other, and both shall be followed to properly complete the work.

##### **1.2 DESCRIPTION OF WORK**

A. Work Included: The Contractor shall provide the labor, materials and equipment necessary to complete the Work of this Section, including but not limited to the following:

- 1. Wall stone work

B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

- 1. SECTION 02200 - EARTHWORK

##### **1.3 SUBMITTALS**

A. Stone source information, proposed stone which will be exposed, including a representative color/shape/texture sample of about 10 to 20 pound size with the bid.

##### **1.4 QUALITY ASSURANCE**

A. The Contractor is responsible for supplying quality stone meeting these specifications and the intent of the project. If the Contractor is not an experienced in stone masonry, it shall employ a stone mason to supervise stone placements and ensure quality stonework construction.

##### **1.5 DELIVERY AND STORAGE**

Store stone at the site in a safe and stable manner. Stone shall not be stacked more than 2 stones high. Provide construction fencing around the stock pile area and sufficient signage to warn the public to stay away and off the stored stone.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

#### **A. Stone**

All imported stone shall be hard durable angular igneous rock, (granite, diorite or similar) with a shape consistent with building a stable rubble stone wall, with at least 3 relatively flat surfaces and preferably a slab or block form. The stone shall be free of oil, grease, paint or other bond inhibiting deposits.

Stones with cracks or soft seams shall be considered as separate blocks, assuming that frost action will eventually open the cracks. Rounded stones will not be accepted. Stones shall be at least 12 inches wide at the narrowest point and imported wall stone (excluding chinking stone), shall be a minimum of 4 cubic feet in volume, with an average size of at least 15 cubic feet. Cap stones shall be at least 15 cubic feet, excluding chinking. Exposed faces shall be selected and placed to show the straightest, flattest face(s) free of defects to the extent possible. Cap stones shall be selected to be free of longitudinal cracks, and have a relatively flat top surface with no more than 8 inches of vertical variation upon final placement.

#### **B. Chinking Stone**

Chinking stone shall be of the same quality as the wall stone and be selected to best match the size and shape of the voids/gaps beings filled. The Contractor shall maintain an adequate supply of chinking stone at the work site to allow for stone size and shape selection.

#### **C. Incidental Concrete**

Field mixed concrete for filling voids, leveling cap stones or other small quantity incidental concrete, consisting of 1.5 parts Type II Portland cement, 2 parts clean sand, and 3 parts coarse aggregate. Alternatively, the Contractor may use premixed bags of concrete and mortar (which utilize Type II or Type IS cement).

Imported rock that will not be considered for this project includes, but is not limited to Gabbro, Pegmatite, Rye formation, Kittery formation, Eliot formation and Berwick formation. Rock containing multiple soft layers or fractures will not be permitted. As a general test, if a stone is dropped onto other large stones from a height of 8 feet, and it breaks or creates spalls more than 12 inches across, there is a good chance it will not approved. If a quarry source is rejected by NHDOT as a concrete aggregate or riprap source, it is unlikely to be approved for this project.

## **PART 3 - EXECUTION**

The wall construction shall be as indicated on the drawings, with neat tight stone placement. Exposed stones shall be selected and placed to show the straightest, flattest face(s), free of defects to the extent possible. The joints between stones

shall be staggered at least 8 inches, between adjacent courses, so as to provide optimum interlocking. Only stone shall be exposed along the top and faces of the wall – footing and backing concrete shall not be visible above mean lower low water or above the exposed soil level.

The stones shall be dry set, with cast-in-place concrete backing. All stones shall be solidly placed and interlocked and any stone placement that allows a stone to rock or move by hand or foot pressure shall be reset.

- End of Section -

